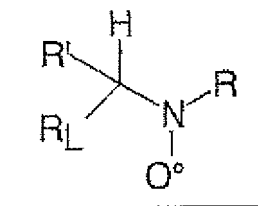


LISTING OF THE CLAIMS

1. (currently amended) A gradient copolymer comprising at least two different monomer units,
  - a) the first ( $M_1$ ), the homopolymer of which corresponding to a  $T_{g1}$  of less than  $20^{\circ}\text{C}$ , representing at least 50% by weight of the total weight of the copolymer,
  - b) the second ( $M_2$ ), the homopolymer of which corresponding to a  $T_{g2}$  of greater than  $20^{\circ}\text{C}$  representing at most 50% by weight of the total weight of the copolymer,
 at least one of the monomers being hydrophilic and representing at least 5% by weight of the total weight of the copolymer,  
 said gradient copolymer comprising at least one monomer  $M_i$  such that the probability of encountering  $M_i$  in any standardized position  $x$  situated on the polymer chain is nonzero; and wherein said gradient copolymer is soluble or dispersible in both water and in organic solvents, and wherein said copolymer has number average and-weight average masses of between 5000 g/mol and 1 000 000 g/mol and a polydispersity index of between 1.1 and 2.5, said copolymer further comprising nitroxide residue units.
2. (previously presented) The copolymer as claimed in claim 1, wherein  $T_{g1}$  is between  $-150$  and  $20^{\circ}\text{C}$ .
3. (canceled)
4. (previously presented) The copolymer as claimed in claim 1, wherein the hydrophilic monomer represents at least 10% by weight of the total weight of the copolymer.
5. (previously presented) The copolymer as claimed in claim 1, wherein the hydrophilic monomer is selected from the group consisting of:
  - ethylenic carboxylic acids, acrylic acid, methacrylic acid, itaconic acid fumaric acid;

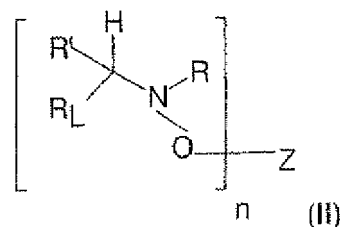
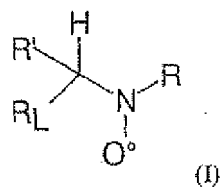
- acrylates and methacrylates of polyethylene glycol or of glycol which are or are not substituted on their end functional group by alkyl, phosphate, phosphonate or sulfonate groups;
  - amides of unsaturated carboxylic acids, acrylamide, methacrylamide and their N-substituted derivatives;
  - aminoalkyl acrylates, methacrylates, aminoalkylmethacrylamides;
  - carboxylic anhydrides carrying a vinyl bond, maleic anhydride, fumaric anhydride;
  - vinylamides, vinylpyrrolidone, vinylacetamide;
  - vinylamines, such as vinylmorpholine, vinylamine; and
  - vinylpyridine.
6. (previously presented) The copolymer as claimed in claim 1, wherein the monomer  $M_1$  is selected from the group of monomers consisting of:
- linear or branched  $C_1$ - $C_{12}$  alkyl acrylates,
  - polyethylene glycol acrylate, polyethylene glycol (meth)acrylate,
  - dienes, butadiene and isoprene.
7. (currently amended) A process for producing a gradient copolymer comprising polymerizing by solution or bulk controlled radical polymerization, at a temperature of between 10 and 160°C, in the presence of a radical polymerization initiator and of an agent for controlling the polymerization, a mixture of monomers comprising at least two monomers, the first ( $M_1$ ), the homopolymer of which corresponding to a  $Tg_1$  of less than 20°C, representing at least 50% by weight of the total weight of the mixture, the second ( $M_2$ ), the homopolymer of which corresponding to a  $Tg_2$  of greater than 20°C, representing at most 50% by weight of the total weight of the mixture, at least one of the monomers having to be hydrophilic and represent at least 5% by weight of the total weight of the mixture, wherein the agent for controlling the polymerization is a nitroxide of general formula:



- where R' and R, which are identical or different and which are optionally connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms which are optionally substituted by hydroxyl, alkoxy or amino groups;
- and where R<sub>L</sub> is a monovalent group with a molar mass of greater than 16 g/mol which can be a phosphorus group or an aromatic group.

8. (cancelled)

9. (previously presented) The process as claimed in claim 7, wherein the polymerization initiator and the control agent are replaced by a mixture composed of alkoxyamine corresponding to the following general formula (II) and of nitroxide corresponding to the general formula (I):



in which:

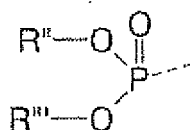
- n is an integer of less than or equal to 8 and preferably of between 1 and 3,
- Z is a carrying monovalent or polyvalent radical of styryl, acryloyl or methacryloyl type,
- where R' and R, which are identical or different and which are optionally

connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms which are optionally substituted by hydroxyl, alkoxy or amino groups;

- and where  $R_L$  is a monovalent group with a molar mass of greater than 16 g/mol which can be a phosphorus group or an aromatic group,

the nitroxide (I) representing from 0 to 20% by weight of the total weight of the mixture.

10. (currently amended) The process as claimed in claim 8 claim 7 wherein, R<sub>L</sub> is a phosphonate group of formula:



- where R'' and R''', which are identical or different and which are optionally connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms which are optionally substituted by hydroxyl, alkoxy or amino groups; the nitroxide (I) representing from 0 to 20% by weight of the total weight of the mixture.

11. (previously presented) A process for the aqueous dissolution, of the gradient copolymer of claim 1 comprising:

- 1) dissolving the copolymer in a ketone solution, at a level of solid of between 20 and 90%,
- 2) neutralizing the solution obtained in 1, if necessary, by addition of a molar solution either of acid or of base, the acid or base choice being conditioned by the chemical nature of the hydrophilic monomer,
- 3) adding water, with vigorous stirring, to the solution obtained in 1 or optionally in 2 in a proportion such that the level of solid obtained is between 1 and 80%; optionally, the water can be replaced by water/alcohol mixtures in proportions ranging from 99/1 to 50/50;

- 4) evaporating the ketone until the desired level of solid is obtained.
12. (canceled)
13. (previously presented) A paint, adhesive, glue or cosmetic formulation comprising the gradient copolymer of claim 1.
14. (canceled)
15. (canceled)
16. (canceled)
17. (previously presented) The copolymer of claim 1 wherein the second monomer ( $M_2$ ), the homopolymer of which corresponding to a  $T_{g2}$  of greater than  $50^{\circ}\text{C}$ .
18. (previously presented) The copolymer as claimed in claim 2, wherein  $T_{g1}$  is between  $-120$  and  $15^{\circ}\text{C}$ .
19. (previously presented) The copolymer as claimed in claim 1, exhibiting a polydispersity index of between 1.1 and 2.
20. (previously presented) The process of claim 7 wherein said controlled radical polymerization, occurs at a temperature of between  $25$  and  $130^{\circ}\text{C}$ .
21. (previously presented) The paint, adhesive, glue or cosmetic formulation of claim 13, wherein said formulation is an aqueous-based formulation.